**Isolation and identification of Lactobacillus spp. from kefir samples in Malaysia**


ABSTRACT

Kefir is a homemade, natural fermented product comprised of a probiotic bacteria and yeast complex. Kefir consumption has been associated with many advantageous properties to general health, including as an antioxidative, anti-obesity, anti-inflammatory, anti-microbial, and anti-tumor moiety. This beverage is commonly found and consumed by people in the United States of America, China, France, Brazil, and Japan. Recently, the consumption of kefir has been popularized in other countries including Malaysia. The microflora in kefir from different countries differs due to variations in culture conditions and the starter media. Thus, this study was aimed at isolating and characterizing the lactic acid bacteria that are predominant in Malaysian kefir grains via macroscopic examination and 16S ribosomal RNA gene sequencing. The results revealed that the Malaysian kefir grains are dominated by three different strains of Lactobacillus strains, which are Lactobacillus harbinensis, Lactobacillusparacasei, and Lactobacillus plantarum. The probiotic properties of these strains, such as acid and bile salt tolerances, adherence ability to the intestinal mucosa, antibiotic resistance, and hemolytic test, were subsequently conducted and extensively studied. The isolated Lactobacillus spp. from kefir H maintained its survival rate within 3 h of incubation at pH 3 and pH 4 at 98.0 ± 3.3% and 96.1 ± 1.7% of bacteria growth and exhibited the highest survival at bile salt condition at 0.3% and 0.5%. The same isolate also showed high adherence ability to intestinal cells at 96.3 ± 0.01%, has antibiotic resistance towards ampicillin, penicillin, and tetracycline, and showed no hemolytic activity. In addition, the results of antioxidant activity tests demonstrated that isolated Lactobacillus spp. from kefir G possessed high antioxidant activities for total phenolic content (TPC), total flavonoid content (TFC), ferric reducing ability of plasma (FRAP), and 1,1-diphenyl-2-picryl-hydrazine (DPPH) assay compared to other isolates. From these data, all Lactobacillus spp. isolated from Malaysian kefir serve as promising candidates for probiotics foods and beverage since they exhibit potential probiotic properties and antioxidant activities.



**Keyword:** Lactic acid bacteria; Lactobacillus; Kefir; Kefir drink; Probiotics